1077-VJ-2495 **Thealexa G Becker*** (tbecker@smith.edu), **Alec Greaves-Tunnell**, **Ryan Ronan** and **Steven J Miller**. *Benford's Law and Dependent Random Variables.*

Many systems exhibit a digit bias. For example, the firstdigit base 10 of the Fibonacci numbers, or of 2^n, equals 1 not 10% or 11% ofthe time, as one would expect if all digits were equally likely, but about30% of the time. This phenomenon, known as Benford's Law, has many applications, ranging from detecting tax fraud for the IRS to analyzing round-off errors in computer science.

The central question is determining which data sets follow Benford's law. Inspired by natural processes such as particle decay, our work examines two models for the decomposition of conserved quantities. Using results from probability, analysis and combinatorics we find conditions under which the processes conform to Benford's Law, thus increasing the number of systems known to be Benford. The main difficulty is dealing with dependent random variables. One way to further explore the relationship between Benford's Law and dependent random variables is to study the copula class of functions . These functions are widely used in the financial industry. We study the relationship between their parameters, number of variables and convergence to Benford's Law, specifically in the family of copulas called the Archimedeans. (Received September 22, 2011)